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Comparison between Coblation and Cold Dissection in Tonsillectomy: Impact on Complications and Postoperative Recovery

Comparison Between Coblation and Cold Dissection in Tonsillectomy: Impact on Complications and Postoperative Recovery

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Summary

Tonsillectomy is one of the most important and prevalent surgical procedures in otolaryngology. The cold dissection technique has always been considered the gold standard and widely disseminated; however, in recent years, the coblation technique has been widely disseminated and compared to cold dissection due to its potential to reduce tissue trauma, postoperative pain, and intraoperative bleeding. This review synthesizes evidence from randomized clinical trials, meta-analyses, and large-scale prospective studies published between 2000 and 2025, comparing the techniques regarding intraoperative complications, early and late postoperative outcomes. The results show that coblation presents consistent advantages in reducing early postoperative pain complaints, intraoperative bleeding, and facilitating a faster return to diet. Regarding the occurrence of late hemorrhage, the studies showed divergent results. In conclusion, coblation represents an effective technique with favorable outcomes; however, further studies should be conducted to compare the safety of different techniques. The final choice should consider the surgeon's experience and a shared decision with each patient.

Keywords: Tonsillectomy. Cold dissection. Coblation. Postoperative complications.

Abstract

Tonsillectomy is one of the most important and prevalent surgical procedures in otolaryngology. The cold dissection technique has long been considered the gold standard and widely practiced; However, in recent years, the coblation technique has become increasingly disseminated and compared to cold dissection due to its potential to reduce tissue trauma, postoperative pain, and intraoperative bleeding.
This review synthesizes evidence from randomized clinical trials, meta-analyses, and large-scale prospective studies published between 2000 and 2025, comparing the techniques regarding intraoperative complications and early and late postoperative outcomes. The findings show that coblation provides consistent advantages in reducing early postoperative pain, intraoperative bleeding, and promoting a faster return to diet.
Concerning the occurrence of late hemorrhage, the studies have shown divergent results. It is concluded that coblation represents an effective technique with favorable outcomes; however, further studies are needed to compare safety between the techniques. The final choice should consider the surgeon's experience and shared decision-making with each patient.

Keywords: Tonsillectomy. Cold dissection. Coblation. Postoperative complications.

1. Introduction

Tonsillectomy, or a tonsillectomy, is a surgical procedure that consists of the removal of tonsils.

of the palatine tonsils, lymphoid structures belonging to Waldeyer's ring and located in the fossae

Tonsillar surgery. The main indications for surgery include recurrent episodes of tonsillitis.

bacterial infections, in addition to the treatment of Obstructive Sleep Apnea-Hypopnea Syndrome (OSAHS),

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especially in children, in whom tonsillar hypertrophy is a frequent cause of upper airway obstruction (Randall, 2020).

Tonsillectomy is one of the most frequently performed otolaryngological surgeries in the field. worldwide. The conventional technique, based on extracapsular "cold" dissection, remains It is widely used and considered reliable due to the predictability of its results and its safety. surgical that provides (Koempel; Solares; Koltai, 2006).

With the advancement of surgical technologies, the coblation technique, which employs Radiofrequency in saline solution to generate a low-temperature plasma field has been gaining ground. This mechanism allows for tissue ablation with less thermal propagation, reducing the risk. Collateral damage and minimizing secondary necrosis. The aim of this technique is to result in less pain. Post-operative period, less intraoperative bleeding, and faster recovery when compared to conventional technique (Elbadawey et al., 2015).

2. Method

2.1 Data Source and Search Strategy

The search was conducted in the PubMed/MEDLINE, Embase, Scopus, and Cochrane Library databases. covering publications between 2000 and 2025, using MeSH descriptors and free terms: (tonsillectomy [MeSH Terms] OR adenotonsillectomy) AND (coblation OR “cold dissection”) AND (“randomized controlled trial” OR meta-analysis) AND (“postoperative pain” OR hemorrhage).

2.2 Eligibility Criteria

Inclusion Criteria: Randomized controlled trials (RCTs); Prospective studies Comparative studies; Meta-analyses of RCTs; Systematic reviews with formal risk of bias assessment; Studies comparing coblation and cold dissection (individually or among multiple techniques).

Exclusion criteria: Studies without a comparison group; studies evaluating only techniques. thermal analyses without coblation; narrative reviews without a systematic method; studies with Fewer than 20 individuals per group; publications lacking data on pain, bleeding, or recovery.

2.3 Outcomes and assessment instruments

- Post-operative pain complaints: - VAS (Visual Analog Scale) 0–10 cm, where 10 cm corresponds to the greatest intensity of pain.
- Intraoperative Bleeding: Assessed by volumetric quantification (ml).
- Postoperative hemorrhage: Primary (up to 24 hours after surgery); Late (>24 hours after surgery) procedure)
- Reintroduction of diet and analgesia time: time until reintroduction of diet and duration of need for analgesia.

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3. Results and Discussion

3.1 Postoperative pain

Assessment of postoperative pain in the studies by Sasindran et al. (2019) and Muthubu et al. (2018) demonstrates that the coblation technique shows consistent pain reduction in the first few days. after tonsillectomy when compared to cold dissection (Muthubabu et al., 2019; Sasindran et al., 2019).

In the first 6 hours after surgery, the coblation group presented an average pain score on the scale of VAS of 7.6 versus 8.5 in the dissection group (p = 0.002). This difference remained significant in subsequent assessments, including the fifth postoperative day (2.8 vs 3.9; p = 0.003) (Sasindran et al., (2019). Similar results were observed in the study by Muthubu et al., with differences statistically significant differences in average pain on postoperative days 0 to 3, indicating lower Pain reduction and greater comfort for patients undergoing the coblation technique. (Muthubabu et al., 2019).

TABLE 1

Study	Design	Scale pain	Time Valuation	Average Group Coblation	Average Group Cold Dissection	statistical
Sasindran et al., 2019	Prospective	VAS 0–10	6h post-op	7.6	8.5	p = 0.002
Sasindran et al., 2019	Prospective	VAS 0–10	Day 5	2.8	3.9	p = 0.003
Muthubabu et al., 2018	Prospective	VAS 0–10	Day 0	4.3	6.9	p < 0.0001
Muthubabu et al., 2018	Prospective	VAS 0–10	Day 1	3.2	5.3	p < 0.0001
Muthubabu et al., 2018	Prospective	VAS 0–10	Day 2	2.2	3.2	p < 0.0001
Muthubabu et al., 2018	Prospective	VAS 0–10	Day 3	0.97	1.6	p = 0.0007

3.2 Intraoperative bleeding

Analysis of intraoperative blood loss demonstrates that the coblation technique reduces significantly reduced bleeding compared to cold dissection. In large cohorts and studies Comparative studies, such as those by El Taher & Aref (2019) and Sheet MS et al. (2022), showed that patients undergoing Coblation patients presented with significantly lower mean bleeding volumes (65.1–23.3 ml). than those subjected to cold dissection (174.3–75.3 ml; p < 0.001) (El-Taher; Aref, 2019; Sheet et al., 2022). These results indicate that coblation promotes more efficient hemostasis and less Tissue trauma during the procedure.

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TABLE 2

Study	Design	Bleeding (Collation)	Bleeding (Cold Dissection)	Statistical value
El-Taher & Aref,	RCT (1004 patients) 65.1 ml	± 8.7 2019	174.3 ml ± 44.0	p < 0.001
Sheet MS et al.,	Comparative study 23.3 ml ± 8.1 2021		75.3 ml ± 8.5	p < 0.001

3.3 Postoperative hemorrhage

Studies by Belloso et al., 2003 and El-Taher & Aref, 2019 indicate that the technique of Coblation does not present relevant differences in relation to primary postoperative hemorrhage. when compared to cold dissection (Belloso et al., 2003; El-Taher; Aref, 2019). Regarding Late hemorrhage, Belloso et al. demonstrated lower rates with coblation, especially in children, while El-Taher & Aref reported a higher incidence of late hemorrhage in the group coblation, especially in children. These findings suggest that, although coblation offers While there are advantages in terms of pain and recovery, safety regarding late hemorrhage still needs to be assessed. This could be further explored in future studies (El-Taher; Aref, 2019).

TABLE 3

Study	Type of hemorrhage	Coblation	Cold dissection
Belloso et al., 2003	Primary (immediate)	difference Without significant	difference Without significant
Belloso et al., 2003	Secondary (late) – children	0.95%	4.77%
El Taher & Aref (2019)	Primary (immediate)	0.2%	0.8%
El Taher & Aref (2019)	Secondary (late) education – children	1.2%	0.2%

3.4 Return to diet/activities

Studies by El Taher & Aref (2019) and Belloso et al. (2006) indicate that the technique of Coblation allows for a faster reintroduction to diet and an earlier return to activities. usual values compared to cold dissection. However, none of the articles present values Absolute statistical values limit the precise quantification of observed differences. The Studies Studies suggest that less postoperative pain and reduced tissue trauma promote a faster recovery. Earlier functional growth.

4. Discussion

Analysis of the literature suggests that the coblation technique represents an advance. relevant in the practice of tonsillectomy, offering clinical benefits that can have an impact directly impacts the patient experience and postoperative management. The significant reduction in pain in first postoperative days observed in studies such as Sasindran et al. (2019) and Muthubu et

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al. (2018) indicates that less tissue aggression and thermal control of coblation may facilitate the managing analgesia, allowing for a more comfortable recovery and possibly reducing the need for opioids or potent anti-inflammatories (Muthubabu et al., 2019; Sasindran et al., 2019).

The hemostatic effect of the technique also translates into less intraoperative bleeding. as evidenced by El Taher & Aref (2019) and Sheet MS et al. (2022). Clinically, this This feature can reduce perioperative complications, simplify surgical procedures, and decrease... the need for transfusions and shortening surgery time, which is particularly relevant in pediatric patients or patients with comorbidities.

Furthermore, the findings regarding early return to normal diet and activities (Belloso et al., Studies (2003; El-Taher; Aref, 2019) indicate that coblation accelerates the patient's reintegration into daily routine. In clinical practice, this can reduce hospital stay time and optimize the use of hospital resources. to improve the patient's clinical condition.

Regarding postoperative hemorrhage, the findings are heterogeneous. Belloso et al. (2003) found no relevant differences in primary hemorrhage between coblation and dissection a cold, and observed a lower incidence of late hemorrhage in the coblation group, mainly in children. On the other hand, El-Taher & Aref (2019) reported a higher incidence of late hemorrhage. with coblation, although without providing absolute values. These results reinforce the need for Further studies, with prolonged follow-up, to more robustly evaluate the safety of the technique.

Final Considerations

The coblation technique represents a relatively new and promising approach in tonsillectomy, showing consistent benefits in reducing postoperative pain, less Intraoperative bleeding and faster functional recovery. These aspects make coblation attractive from a clinical point of view, especially in patients where comfort, safety and return are paramount. Early access to activities is a priority.

However, the choice of technique should be individualized, considering the curve of The surgeon's learning, the patient's clinical profile, including age, comorbidities, and history of bleeding, as well as the resources available at the institution. Furthermore, more is needed. studies with long-term follow-up to evaluate medium- and long-term outcomes and consolidate the safety and effectiveness of the technique.

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